Structure of Arteries and Veins

Composed of 3 layers (tunics)

1. Tunica Intima – simple squamous epithelium

Called endothelium! (plus basement membrane C.T.)

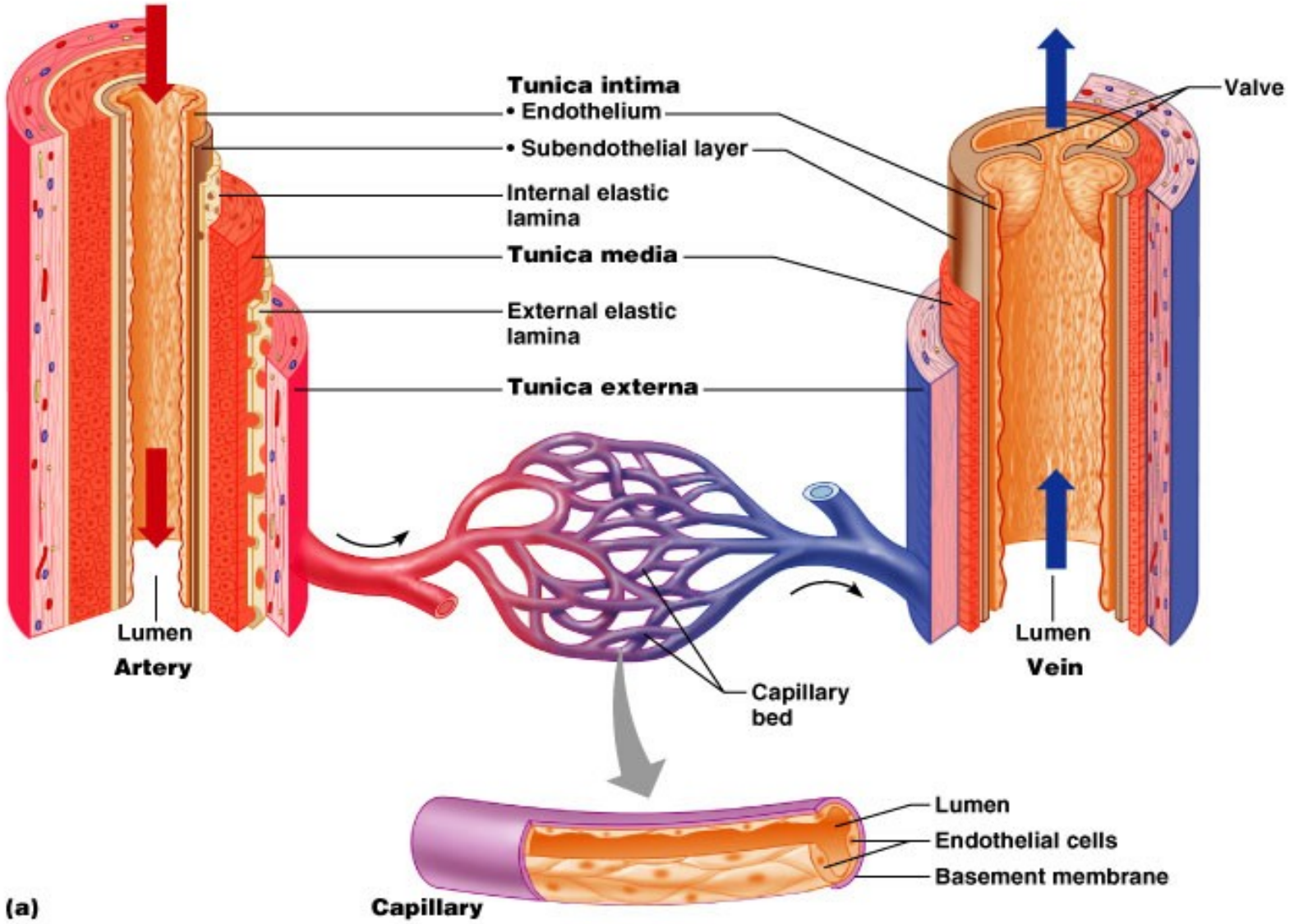
2. Tunica Media – sheets of smooth muscle

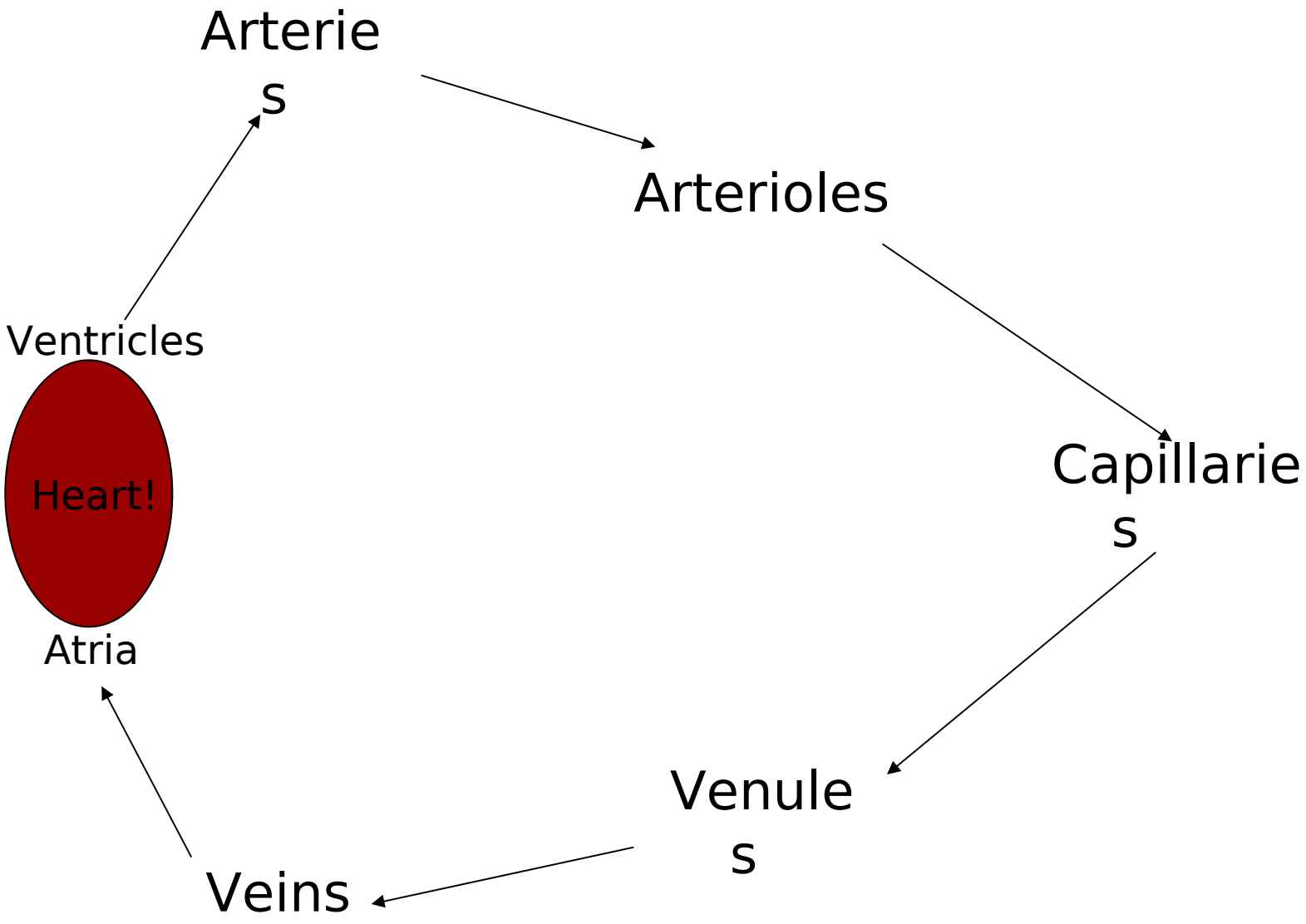
Contraction – vasoconstriction

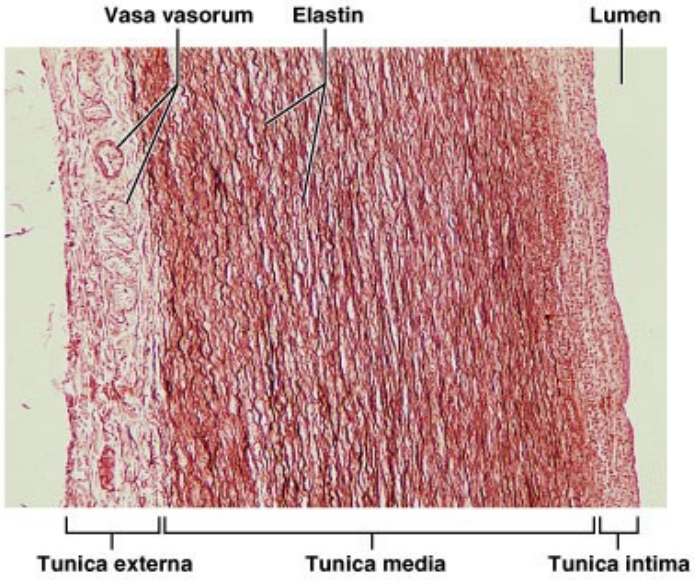
Relaxation – vasodilation

3. Tunica Externa – connective tissue

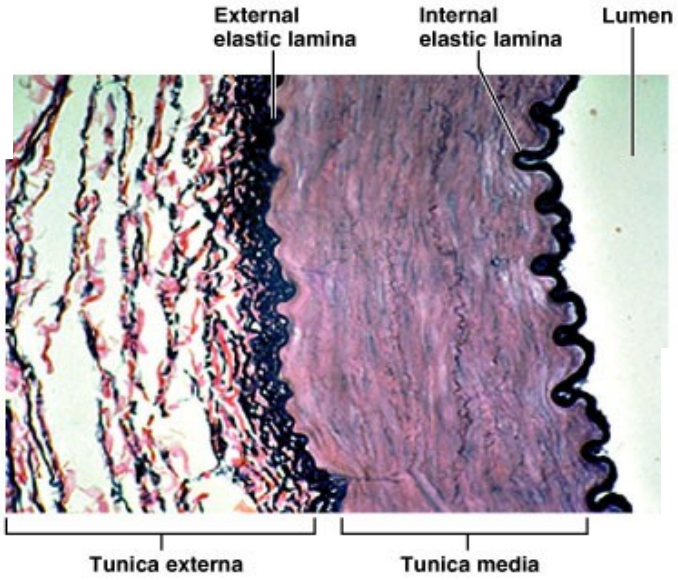
* Lumen – central blood-filled space of a vessel


Tunica intima
• Endothelium
• Subendothelial layer
Internal elastic lamina
Tunica media
External elastic lamina
Tunica externa
Valve
Lumen
Artery
Lumen
Vein
Capillary bed
Lumen
Endothelial cells
Basement membrane
Capillary
(a)

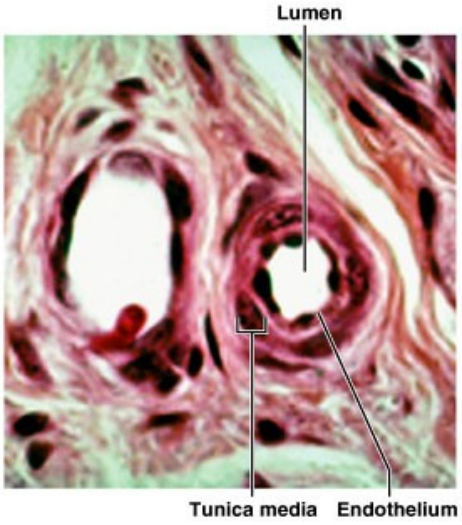

Arteries
Arterioles
Capillaries
Venules
Veins
Atria
Heart!
Ventricles



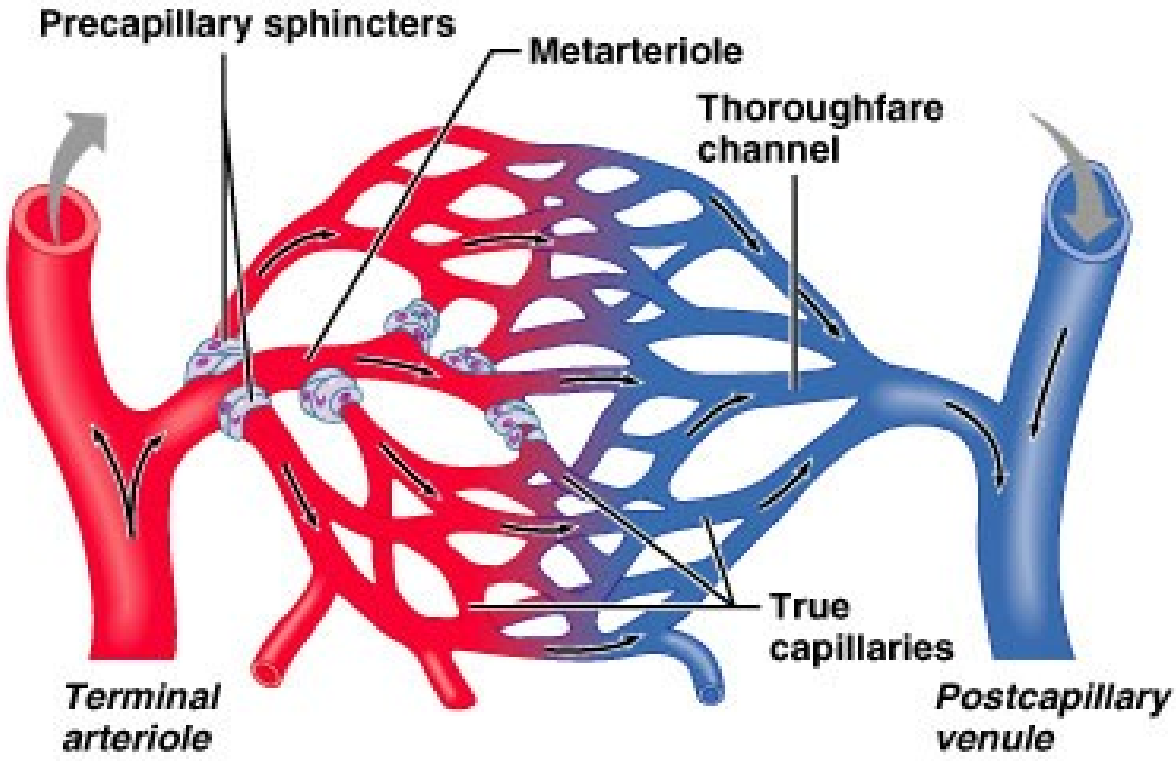
(a) Elastic artery (aorta)



(b) Muscular artery

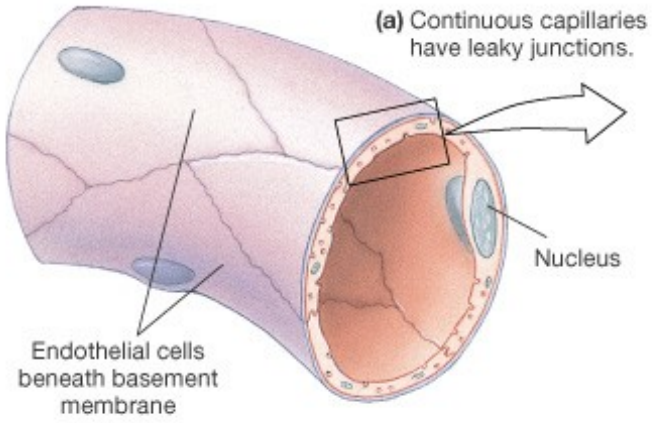


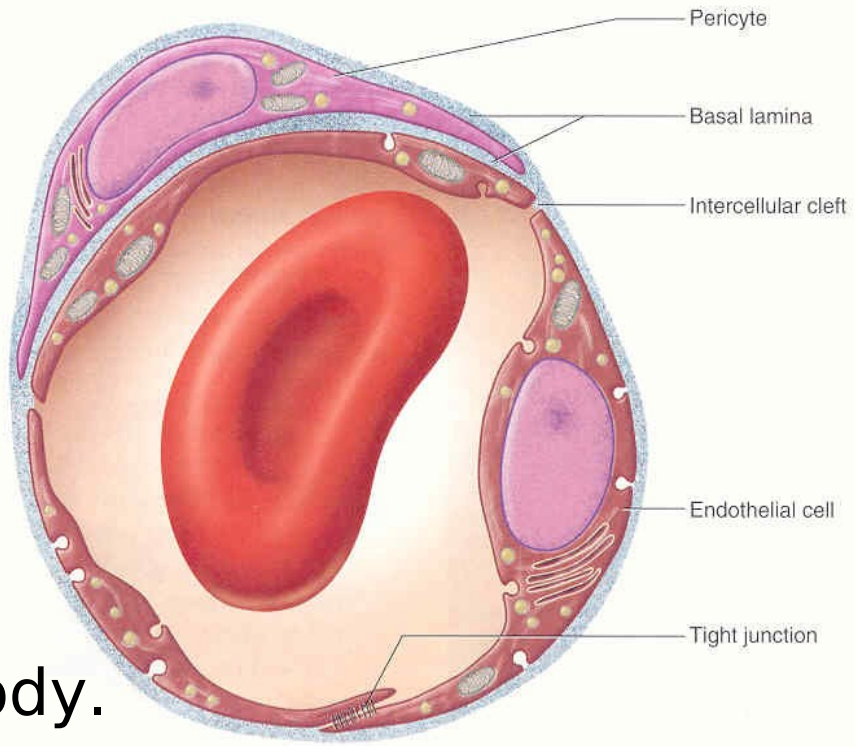
(c) Small arteriole



(a) Sphincters open

3 Types of Capillary Beds



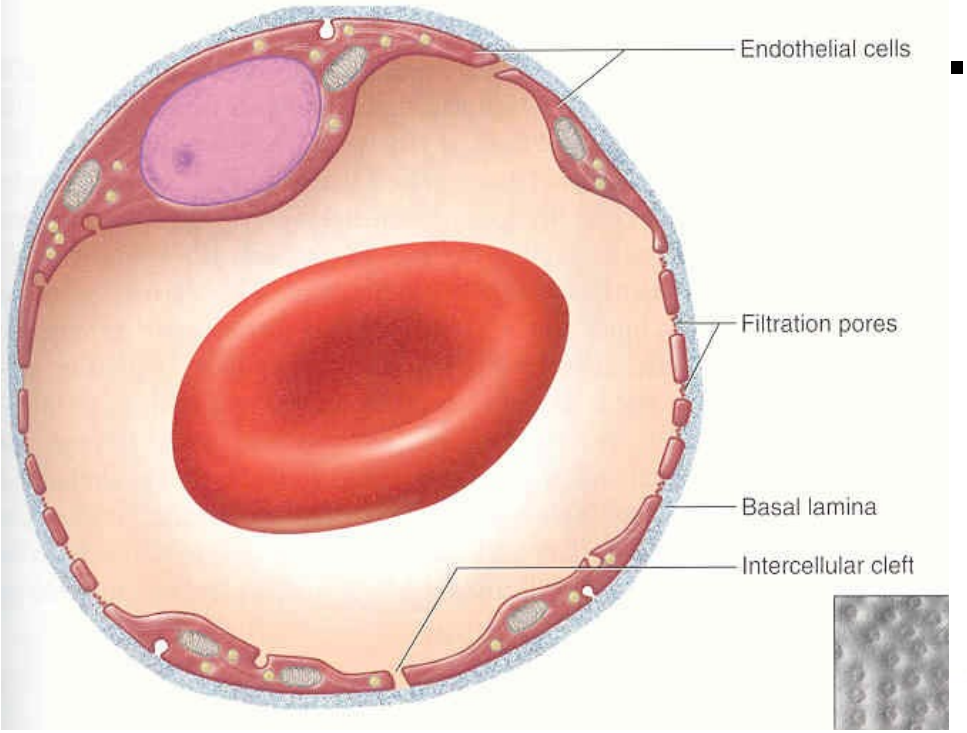


1. Continuous Capillary Bed

- most common type in the body.

- have tight junctions

- ‘leaky’ capillaries

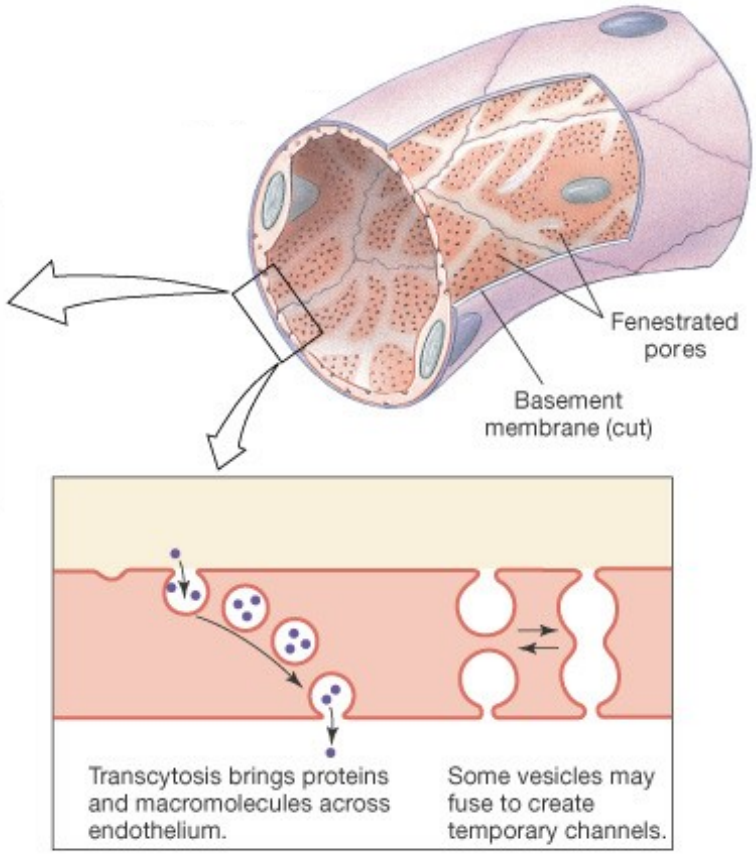


. Fenestrated Capillary Bed

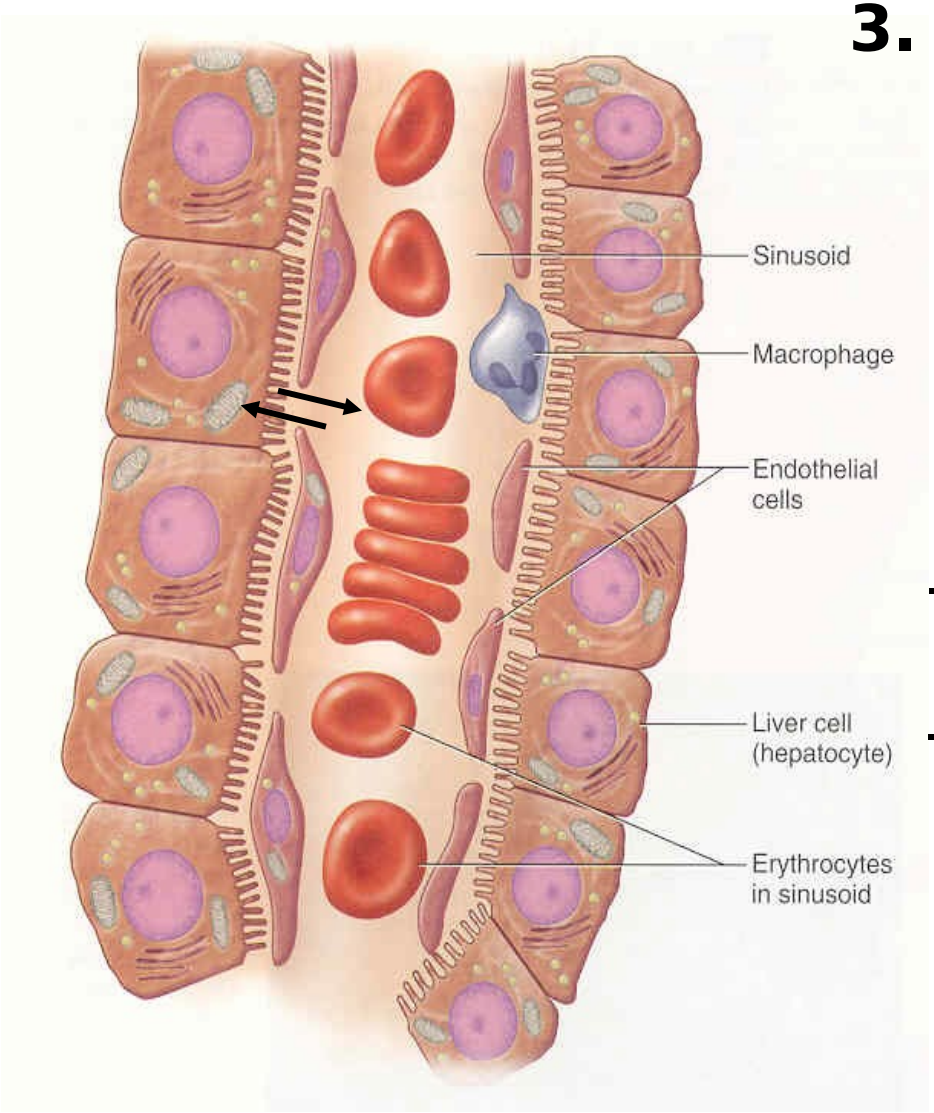
- have ‘pores’ or *fenestration*

- more ‘leaky’ than continuou

specific locations in body:
e.g., kidney and synovial joints.


Fenestrated pores
Basement membrane (cut)
Transcytosis brings proteins and macromolecules across endothelium.
Some vesicles may fuse to create temporary channels.

3. Sinusoidal Capillary Bed



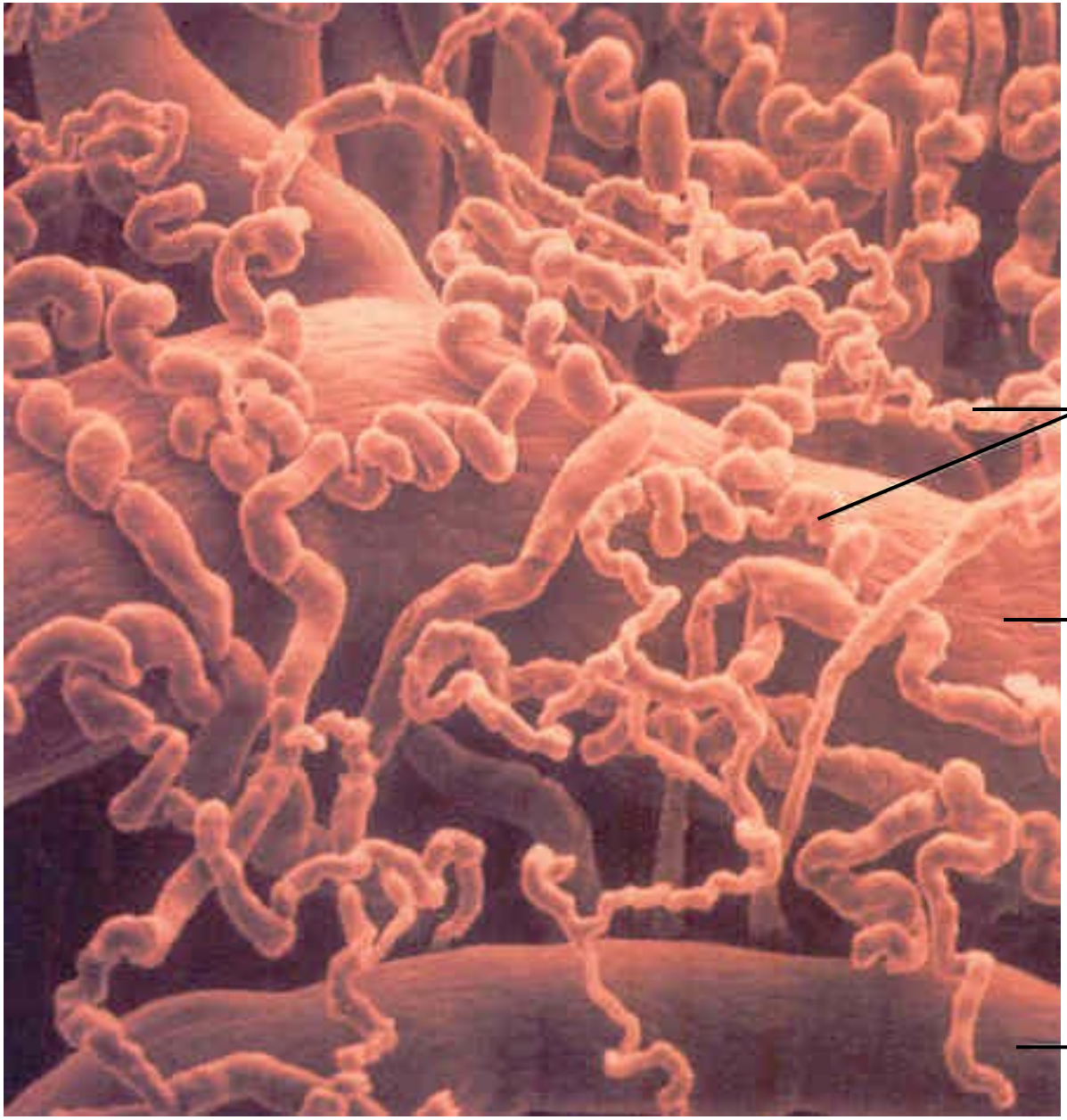
- open ‘flaps’ in adjacent endothelial cells.

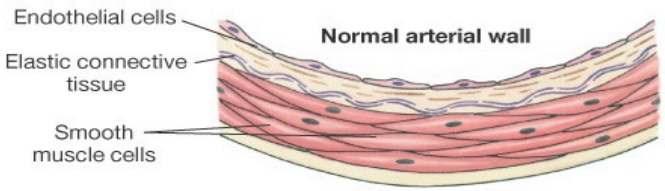
- ‘leakiest’ capillary bed.

- high degree of exchange.

- highly convoluted (twisting).

- least common in body: e.g., liver and spleen.

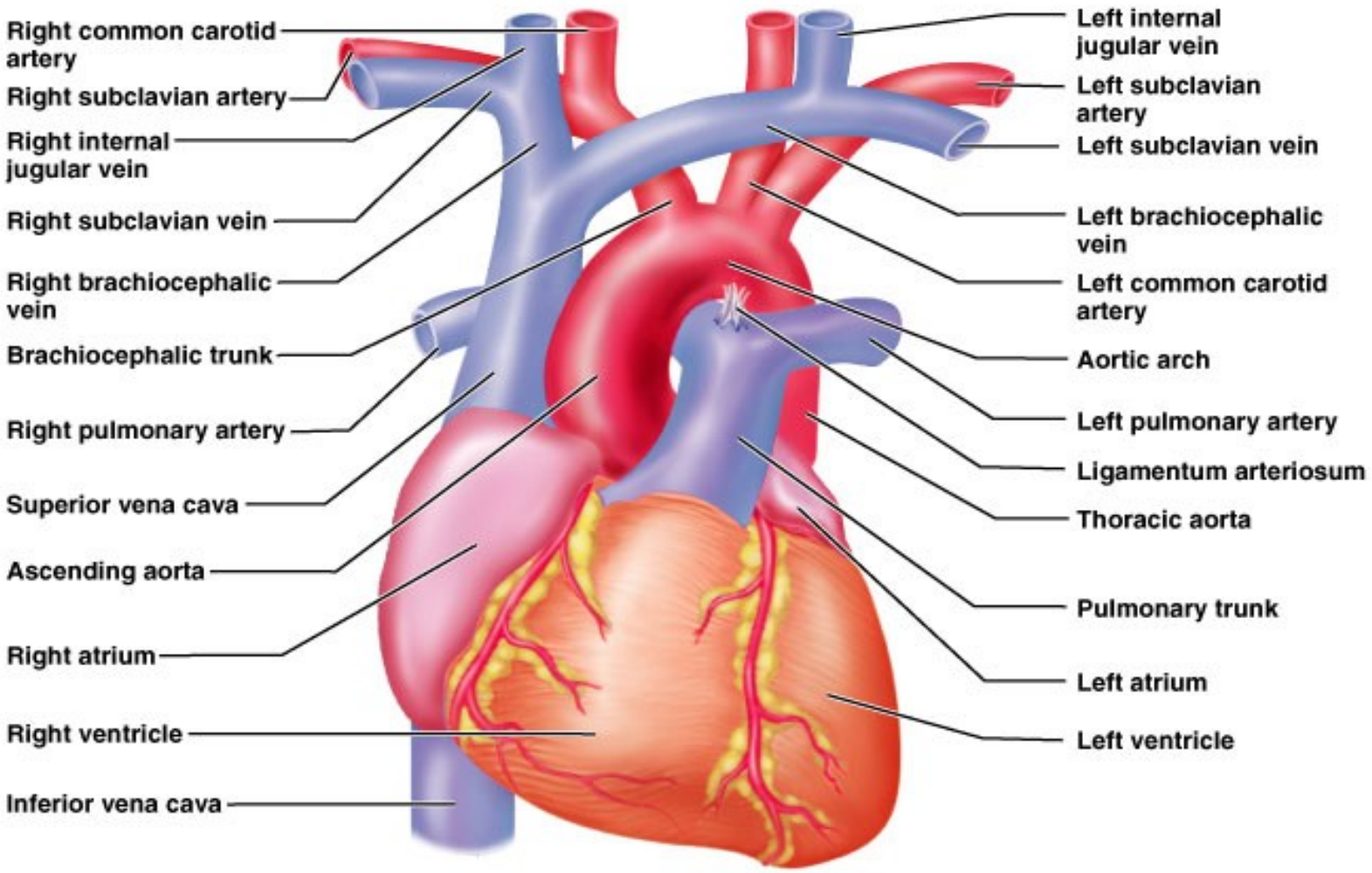

Capillari
es
Venule
Ateriole



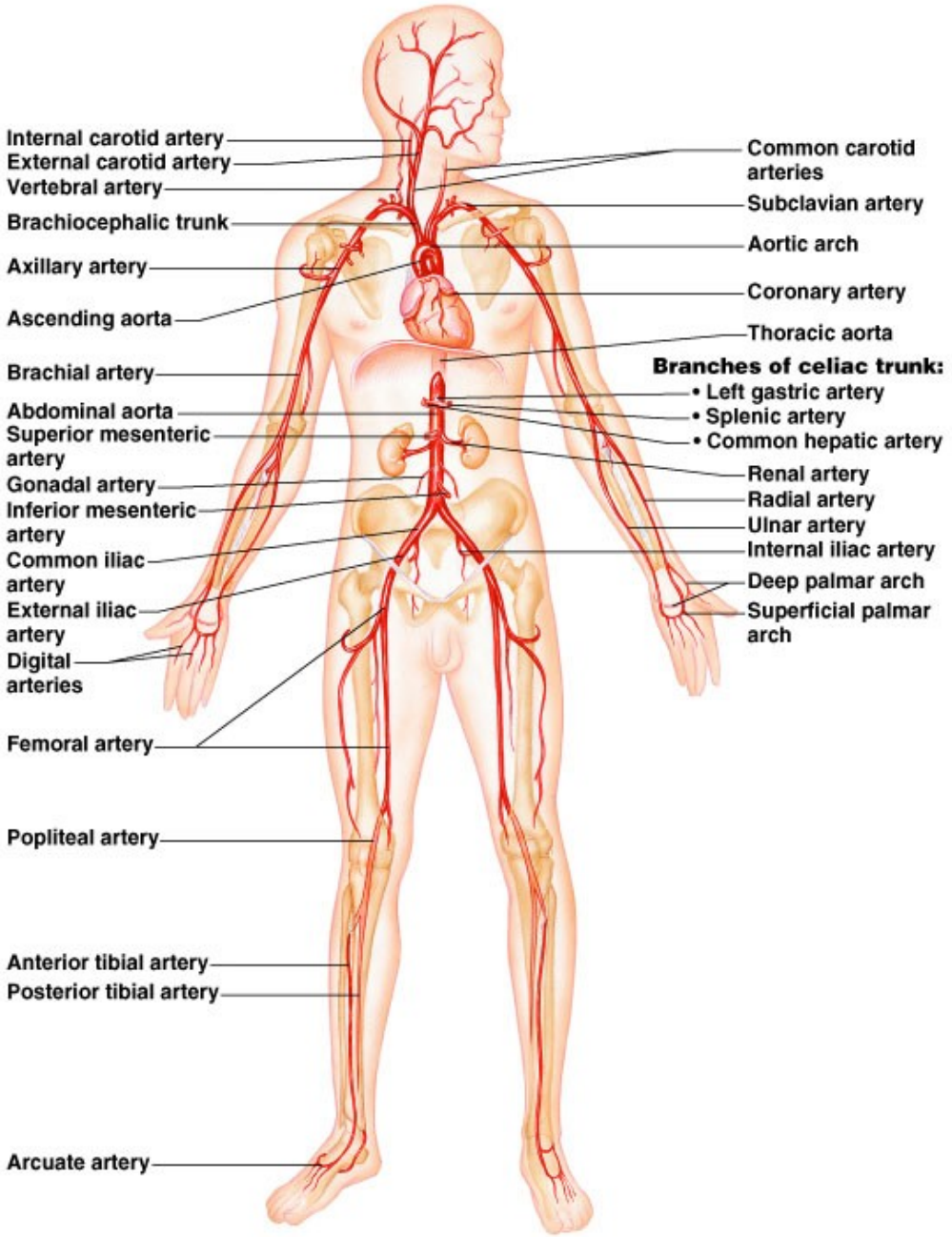
Arteriosclerosis
= hardening of vessel wall.

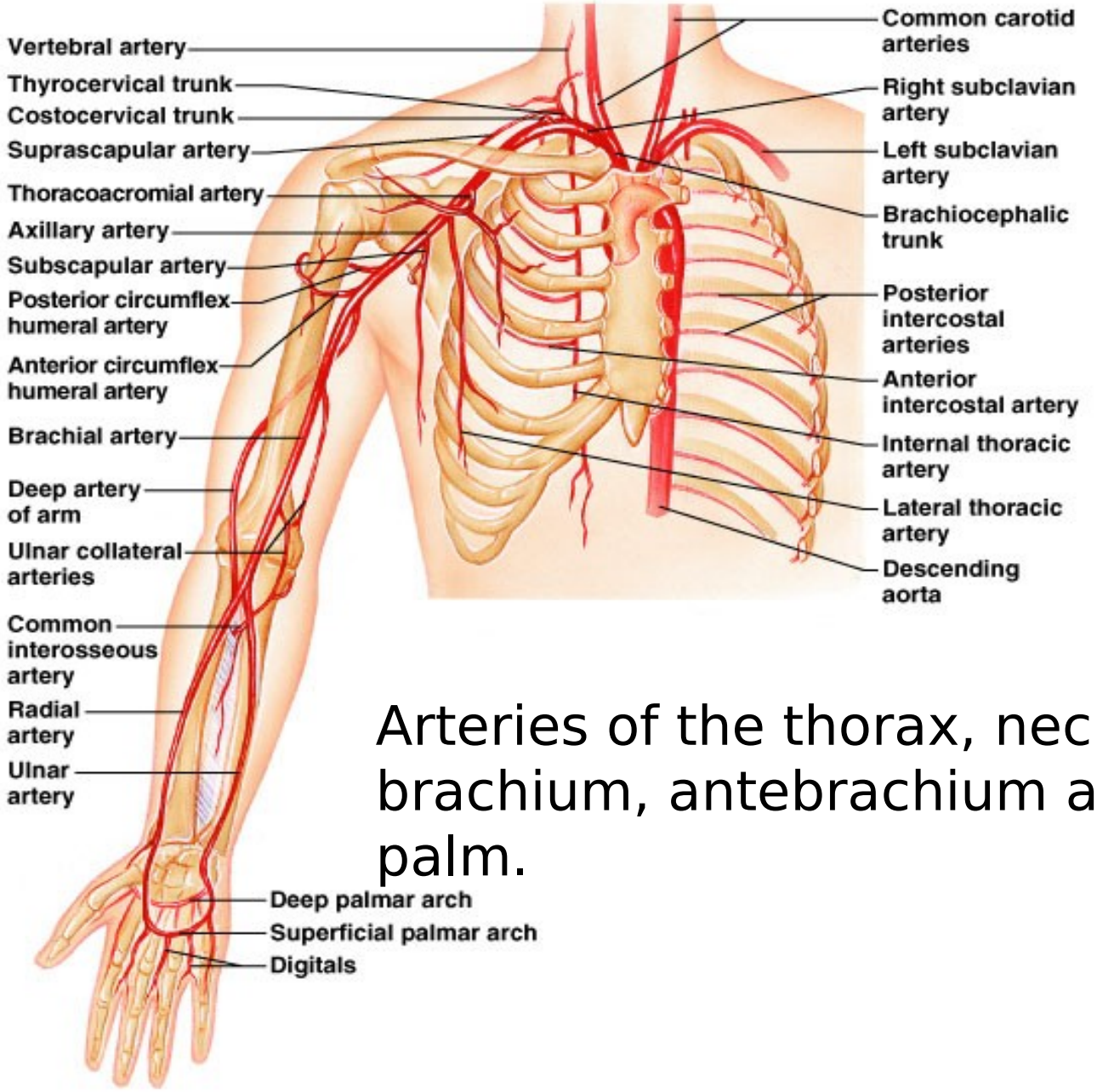
Atherosclerosis
= deposits of lipids in blood vessel wall, forming a plaque results in hardening and narrowing of vessel.

Vessels of the Heart



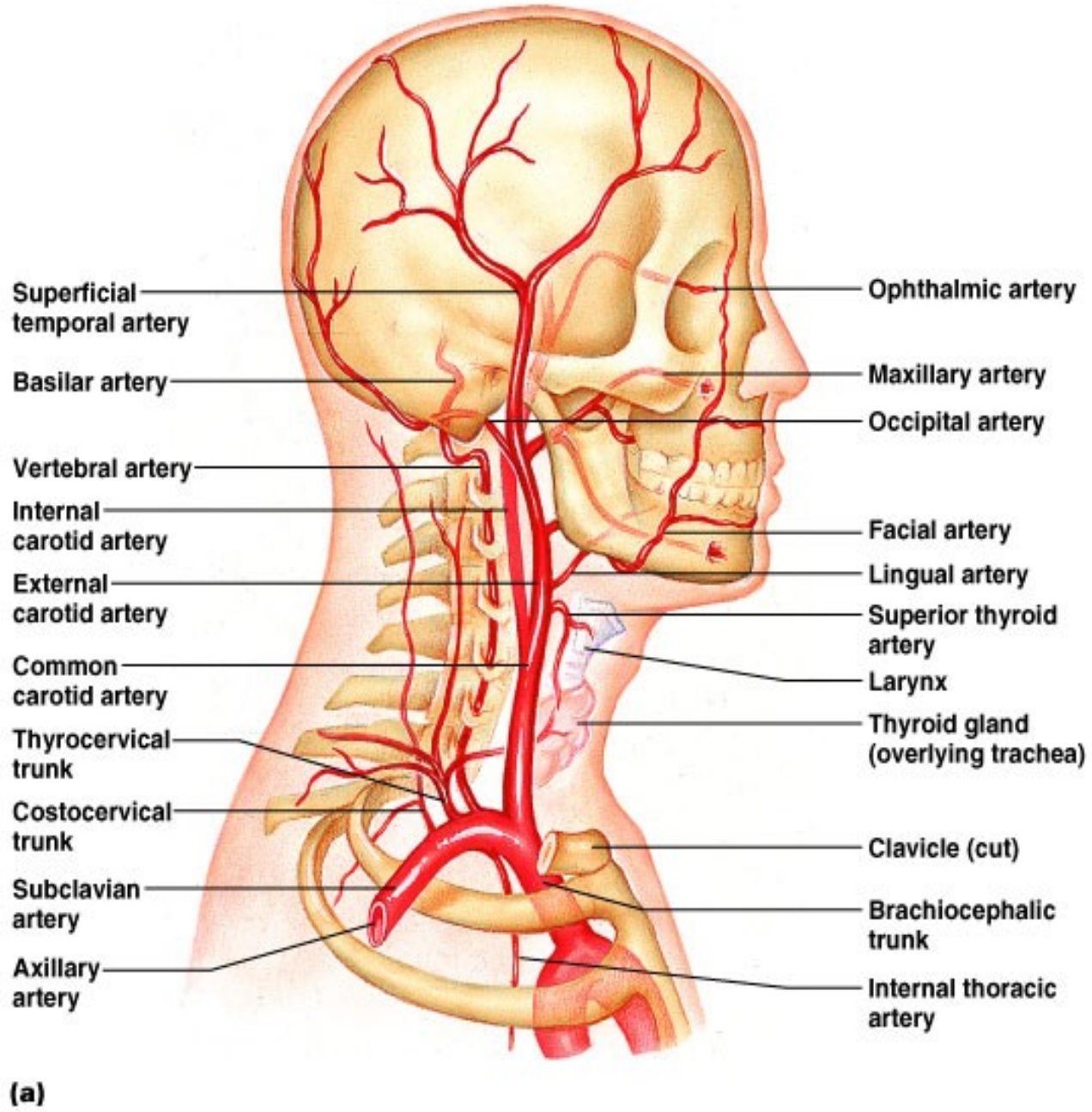
Arteries of the Systemic Circulation



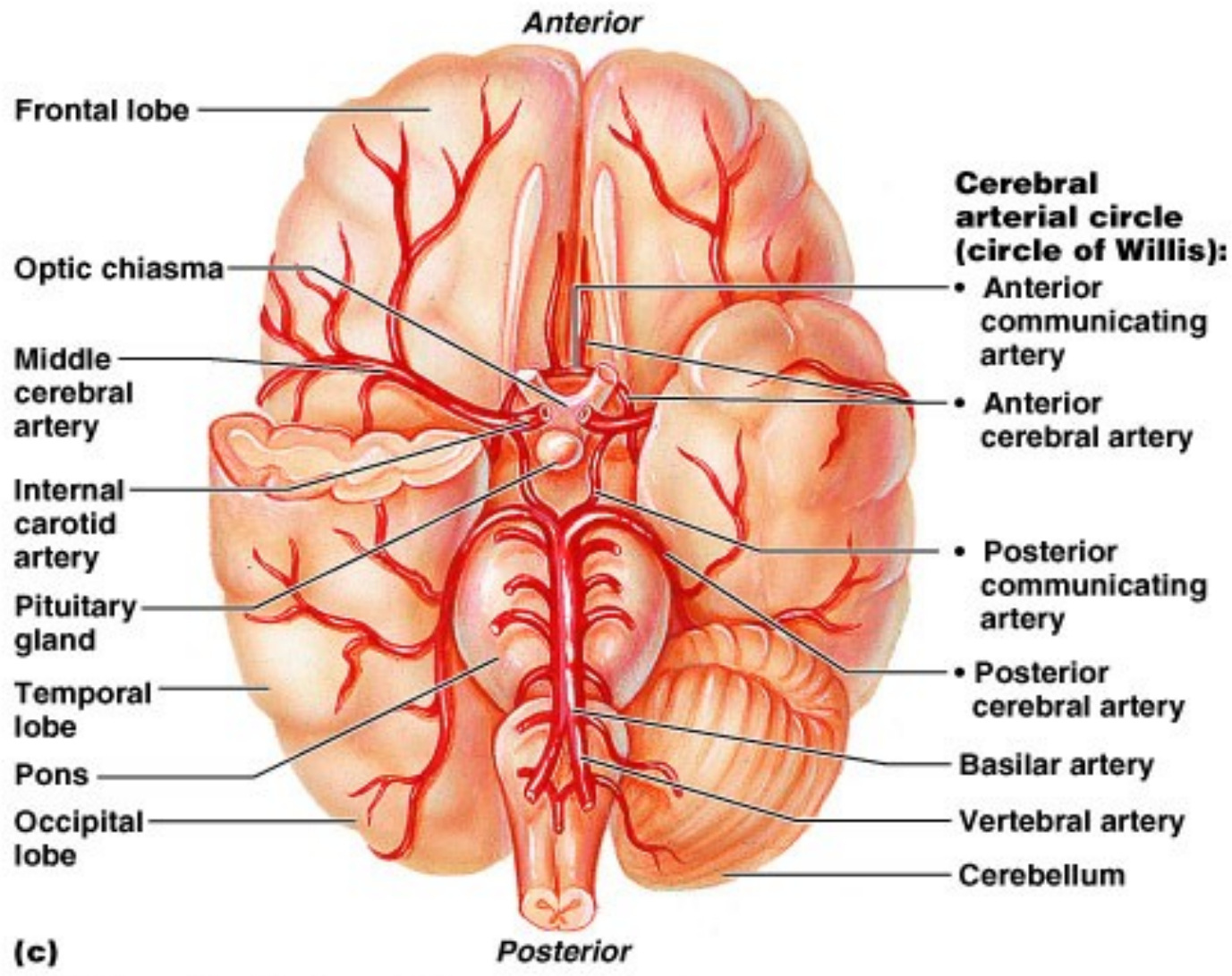


Arteries of the thorax, neck, brachium, antebrachium and palm.

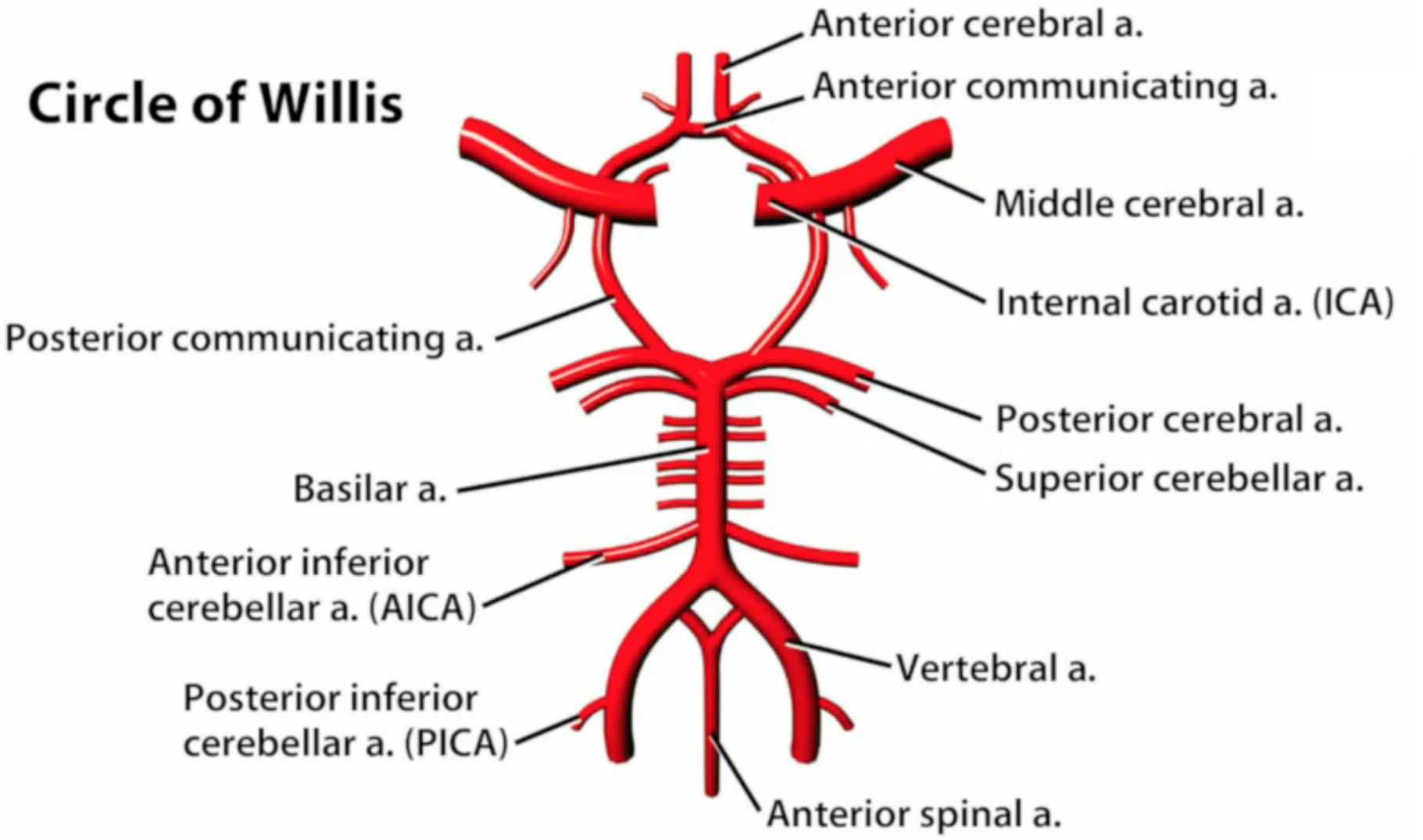
Arteries of the Head and Neck



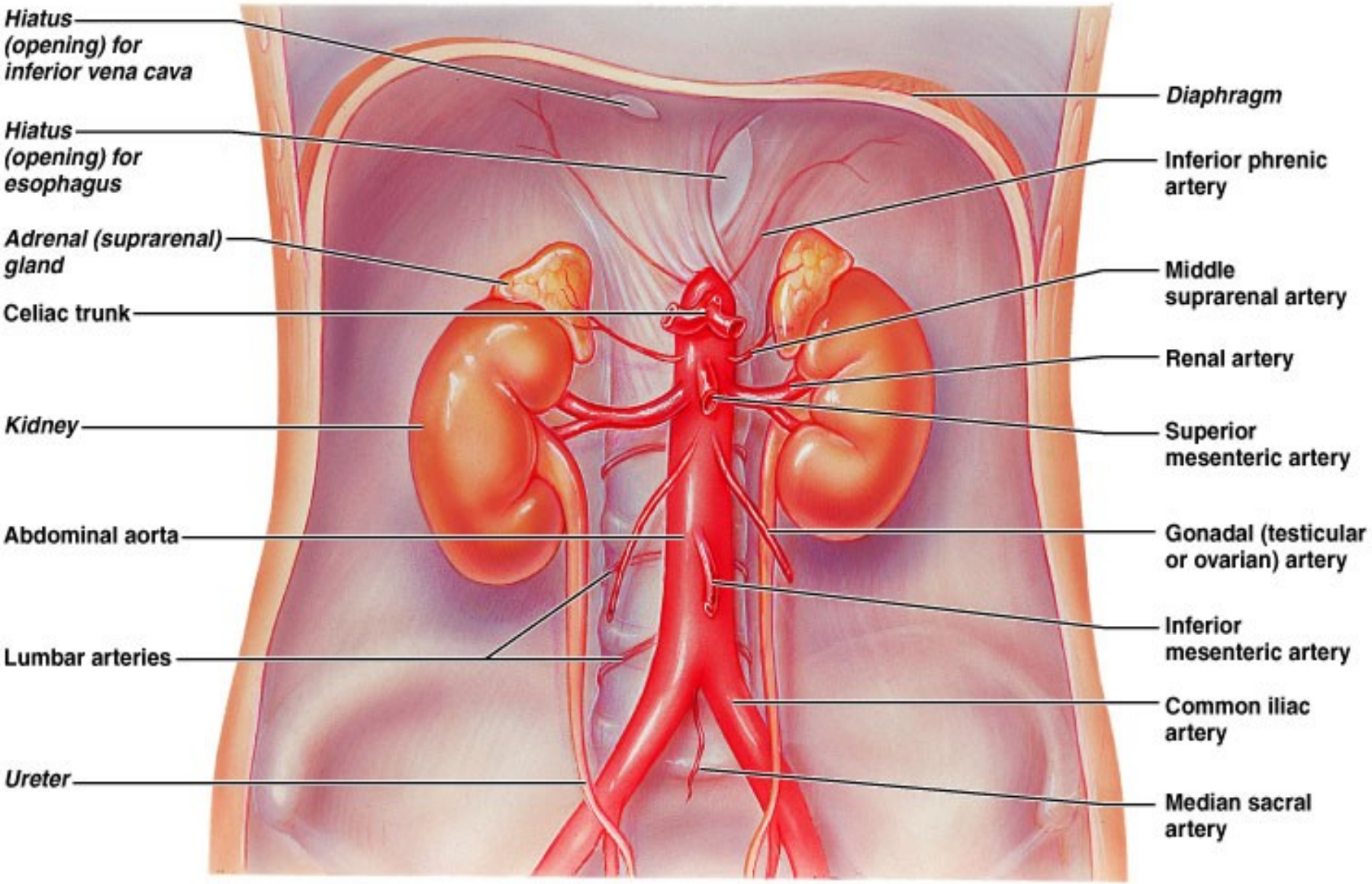
Arteries of the Brain



Cerebral Arterial Circle



Arteries of the Abdomen

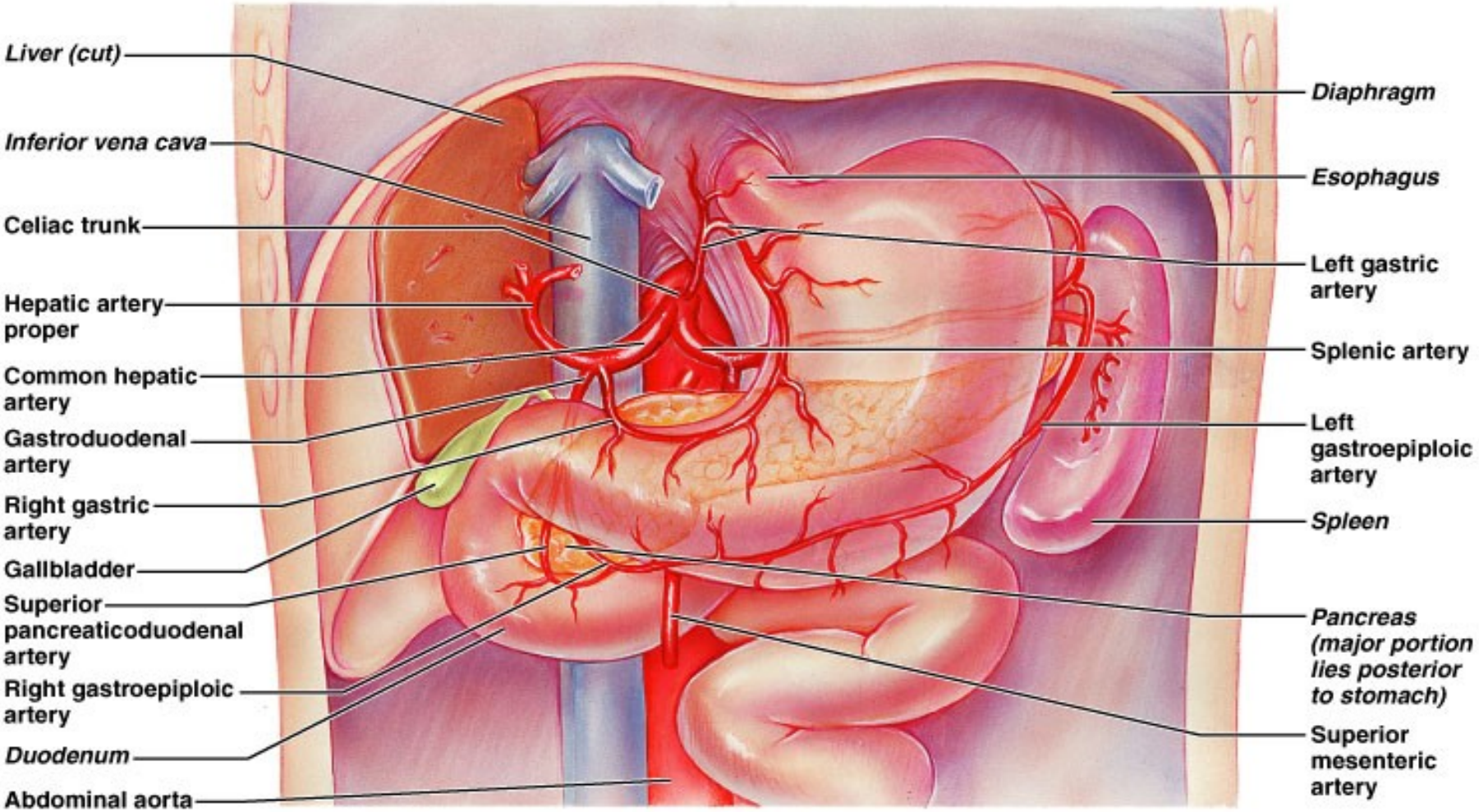


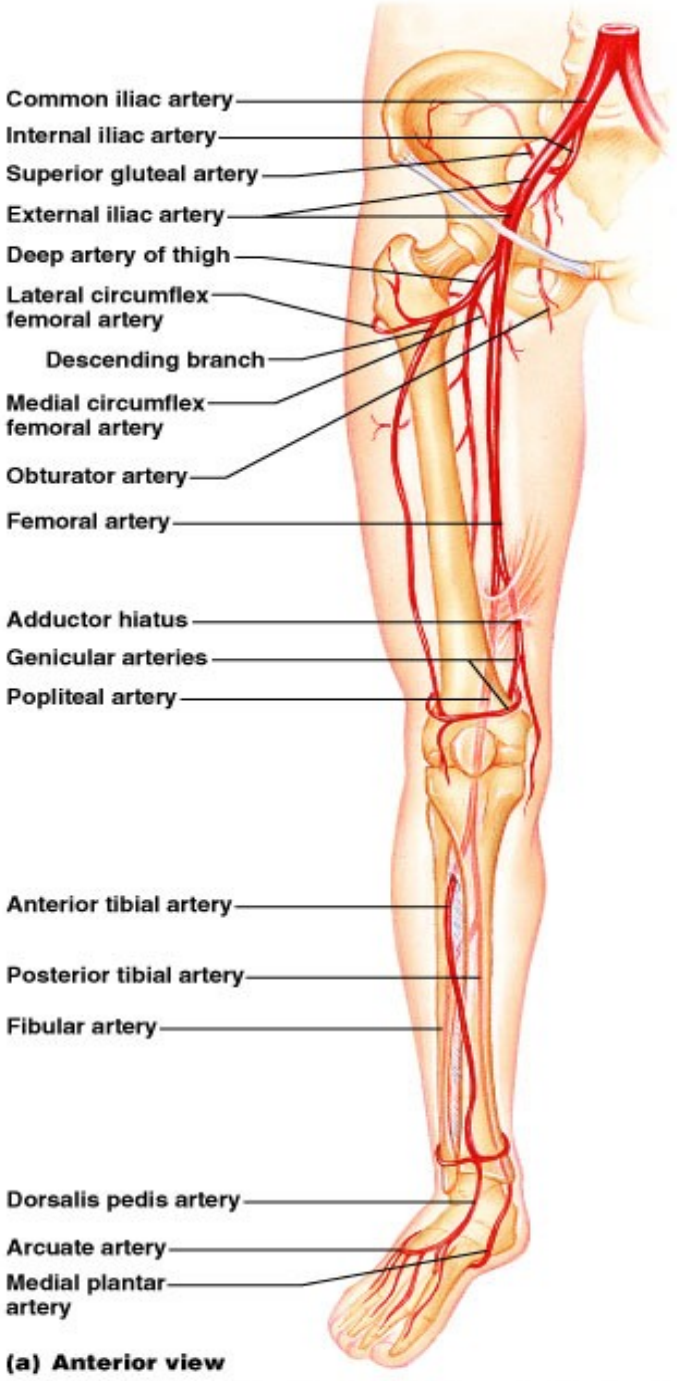
Aortic Aneurysm

<u>Aneurysm</u>: Weakening of A vessel wall; Results in bulging due to pressure in vessel.

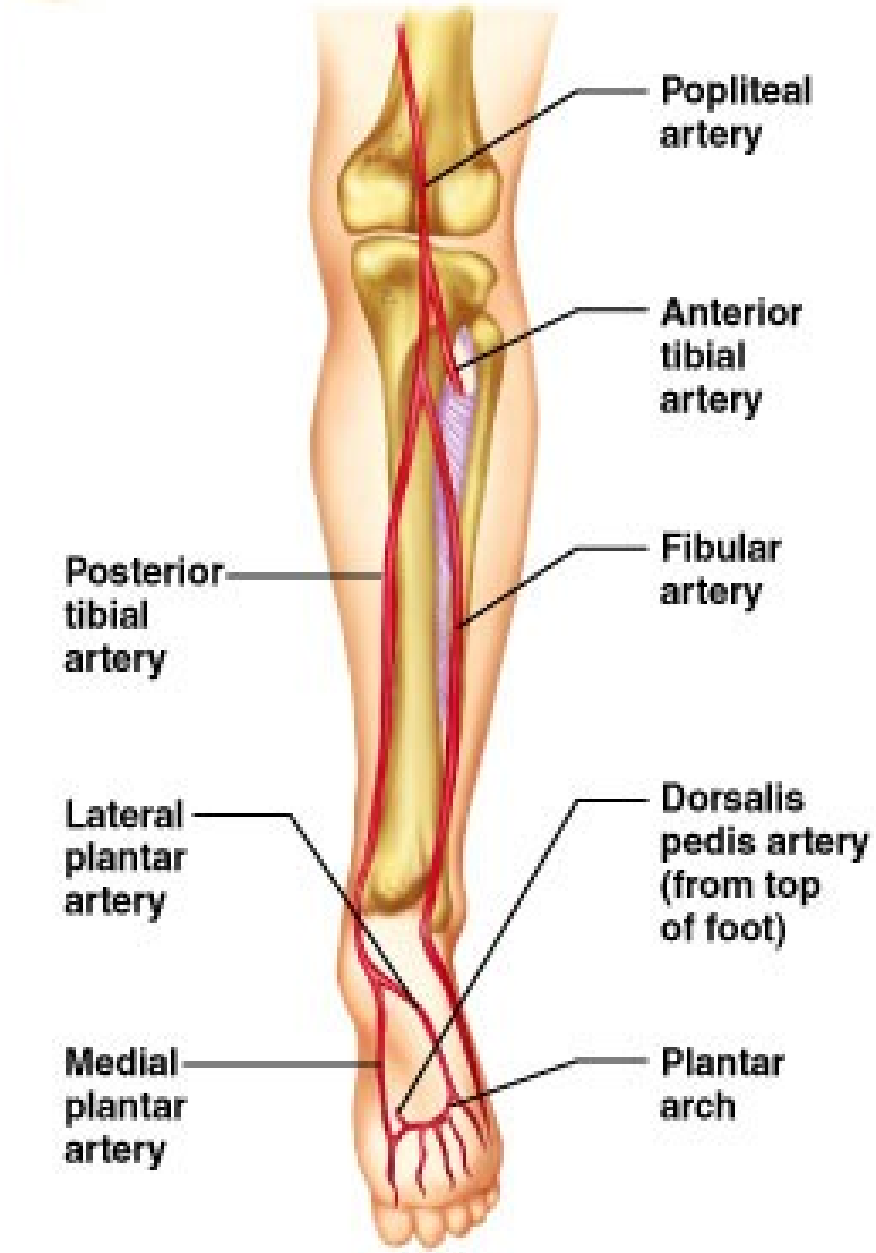
Poses threat of hemorrhage.

The Celiac Trunk

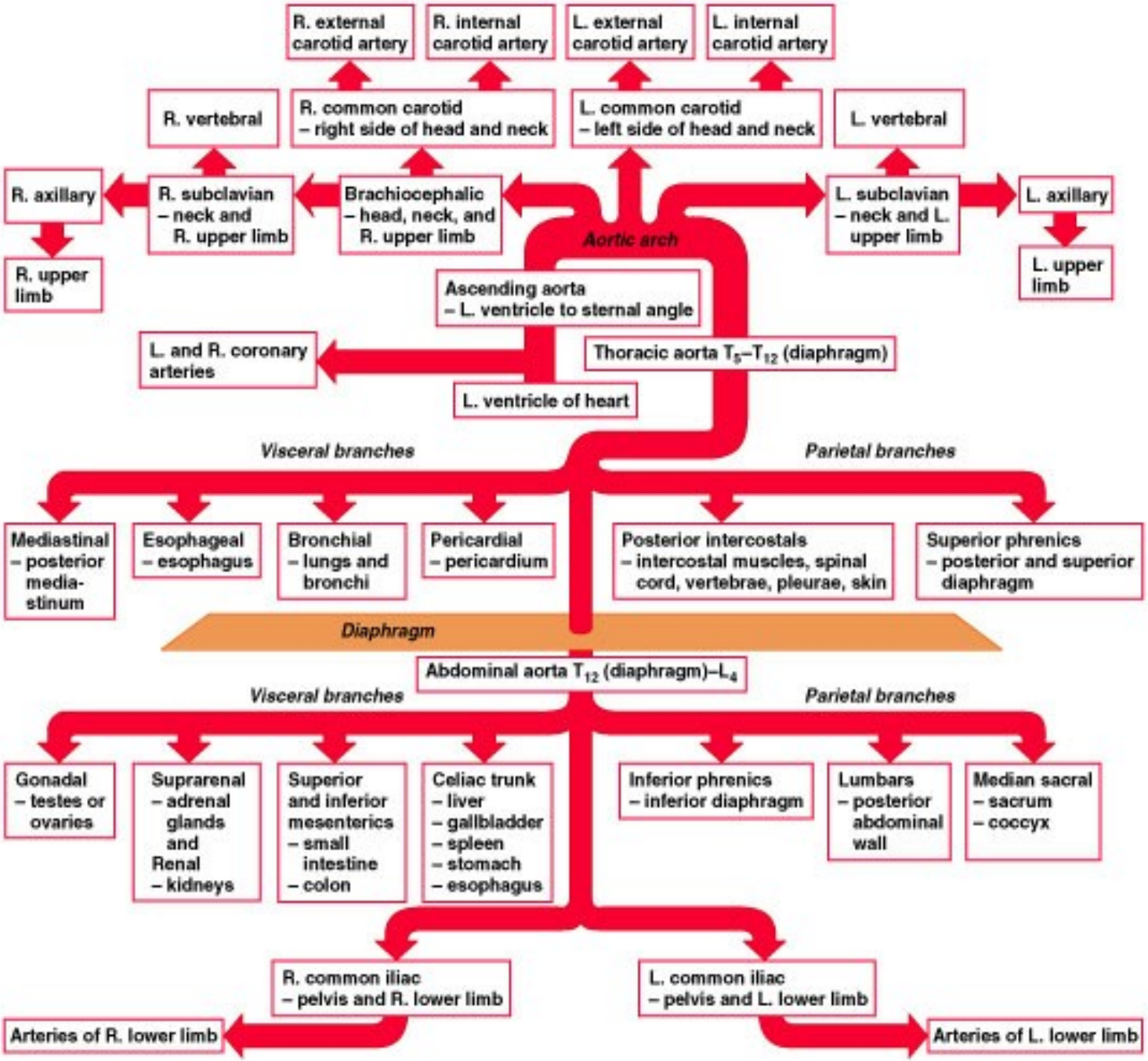




Arteries of the Hip, Thigh, Leg and Foot



(b) Posterior view


R. external carotid artery
R. internal carotid artery
L. external carotid artery
L. internal carotid artery
R. vertebral
R. common carotid – right side of head and neck
L. common carotid – left side of head and neck
L. vertebral
R. axillary
R. subclavian – neck and R. upper limb
Brachiocephalic – head, neck, and R. upper limb
Aortic arch
L. subclavian – neck and L. upper limb
L. axillary
R. upper limb
L. upper limb
Ascending aorta – L. ventricle to sternal angle
L. and R. coronary arteries
Thoracic aorta T_5–T_{12} (diaphragm)
L. ventricle of heart
Visceral branches
Parietal branches
Mediastinal – posterior media-stinum
Esophageal – esophagus
Bronchial – lungs and bronchi
Pericardial – pericardium
Posterior intercostals – intercostal muscles, spinal cord, vertebrae, pleurae, skin
Superior phrenics – posterior and superior diaphragm
Diaphragm
Abdominal aorta T_{12} (diaphragm)–L_4
Visceral branches
Parietal branches
Gonadal – testes or ovaries
Suprarenal – adrenal glands and Renal – kidneys
Superior and inferior mesenterics – small intestine – colon
Celiac trunk – liver – gallbladder – spleen – stomach – esophagus
Inferior phrenics – inferior diaphragm
Lumbars – posterior abdominal wall
Median sacral – sacrum – coccyx
R. common iliac – pelvis and R. lower limb
L. common iliac – pelvis and L. lower limb
Arteries of R. lower limb
Arteries of L. lower limb